Geomagic Leica Tracker Plug-In 1.0 User's Manual

Overview

The Geomagic Leica Tracker Plug-In supports the Leica AT901 Laser Tracker in Geomagic Qualify, Geomagic Qualify Probe, Geomagic Studio, and Geomagic Wrap.

A separate Plug-In supports the Leica/Steinbichler T-Scan system used with the Leica Tracker. It is available from the Geomagic Support Downloads website.

The Tracker is available as a Hard Probing Device in Geomagic software.

Installation

Please see the release notes on the Geomagic Support Downloads page for installation instructions.

Available Commands

After selecting the Leica Tracker Plug-In, the following commands will invoke the Leica Tracker. Please read the application documentation for instructions on each command.

Geomagic Qualify and Qualify Probe

Capture tab (Qualify) or Home tab (Qualify Probe)

Align Group

- Orient to World
- Move Device
- 3-2-1 Alignment
- Iterative Alignment

Collect group

- Probe Points
- Probe Sections
- Quick Probe
- Probe Features

Measure group

- All measurements

Analysis group

- Probe Compare
- Real-Time Deviation

Options group

- Plug-In Options

Geomagic Studio and Wrap

Capture tab

Align Group

- Orient to World
- Move Device

Collect group

- Probe Points
- Probe Sections
- Probe Features

Measure group

- All measurements

Options group

- Plug-In Options

Configuration File

A few settings for the Tracker Plug-In are stored in a configuration file and not accessible through the graphical interface.

Location

The configuration file is called **config.xml**. It is stored alongside the Plug-In DLL.

The default location is **C:\Program Files\Geomagic\Common\V13\leicatracker\config.xml**.

Replace **Program Files** with **Program Files (x86)** for 32-bit software running on a 64-bit operating system.

Contents

IPAddress

The Tracker's IP address. If you are not sure, start up the Tracker Server and it will eventually display the IP address on the front panel.

PortNumber

The Tracker's port number. Generally set to 700.

ToleranceMeters

The maximum allowed value for the standard deviation of all measurements collected into a single-point measurement. If the standard deviation is too large, the Plug-In will reject the point. Large standard deviations occur when the reflector or probe is moved during the measurement

Connecting

- The first time you click on any of the commands listed in the previous section, the Tracker Plug-In will connect to the Tracker hardware.
- The Tracker's IP address must be set correctly in the **config.xml** configuration file (see previous section).
- Your network adapter must be set to a static IP address in the same subnet as the Tracker.
- If the Tracker is not initialized, the Plug-In will initialize it upon the first connection. This can take up to 60 seconds.
- After making the initial connection, the Plug-In will stay connected until you manually disconnect by clicking the **Disconnect** button.

Capturing Points

T-Probe Buttons

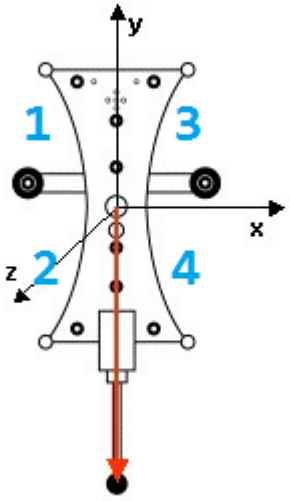

Figure 1: Buttons and Orientation of the T-Probe

The T-Probe buttons are numbered in blue in Figure 1.

Single-Point Collection

Buttons 1 and 2 collect a point.

Buttons 3 and 4 exit from single-point collection mode.

Feature Probing

Buttons 1 and 2 collect a point.

If you have probed enough points to define a feature, buttons 3 and 4 define an offset point. If not, they back out of the feature probing command.

After defining an offset point or exiting a probing command, the application will start a new feature automatically. To fully exit feature probing, press button 3 or 4 again.

Continuous Collection, Probe Sections, Real-Time Deviation

Buttons 1 and 2 start and pause collection.

Buttons 3 and 4 exit out of the command.

User Interface Guide

General

The user interface will pop up whenever you enter an alignment or probing command.

If you close the interface with the Windows “X”, you must start a new alignment or probing command to get it back.

The user interface is composed of:

Indicators

Display information from the Tracker hardware.

Controls

Send parameter values to the Tracker.

Buttons

Invoke actions in the Tracker.

Indicators

These interface elements display feedback from the hardware. They are not interactive.

Status Box

Displays one of 5 possible statuses with a color-coded background. The possible statuses are:

Grey – Not Connected.

The Plug-In has not connected with the tracker hardware. All other controls are disabled.

Green – Ready

The tracker is connected and locked on to a reflector or T-Probe. Ready to collect data.

Red – Not Ready

The tracker is not locked on to a reflector, or some other problem is preventing the tracker from successfully acquiring data.

Yellow – Busy

The tracker is busy executing another command and will not respond to more commands. This is typically seen during initialization or point collection.

Blue – 6D Invalid

The tracker is locked on to a T-Probe, but some of the optical indicators are not visible to the Tracker camera, so it cannot calculate the orientation.

Probe Data

This field will display the tracker's feedback on the current reflector or probe it is tracking.

T-Probe

If you are using a T-Probe, this field will show the diameter of the probe tip.

Plain Reflector

If you are using a reflector, the **Reflector** menu will become available. This field should show the reflector you select from the menu. If it shows a different reflector, then your setting has not been sent to the tracker successfully.

Weather Data

This field will display weather data from the Tracker's Meteo Station. If no Meteo Station is attached, this field will display "No Weather Data" until you choose manual weather settings using the **Set Weather** button.

Controls

Reflector Menu

Displays a list of all the reflectors that have a compensation stored on the Tracker server. When a reflector is selected, the tracker server loads the appropriate compensation.

It's important to select the correct reflector. Every reflector is different. For example: if you have two 1.5-inch Red Ring Reflectors compensated for your system, take care to distinguish between them.

Single-Point Time

The time, in milliseconds, that the tracker will take to collect measurements for a single point acquisition.

More time will average out noise leaving a more accurate measurement. However, if the reflector moves too much during the measurement, it will be rejected (see **Config File: Tolerance**).

Search Distance

The approximate distance in meters from the Tracker to the object you are measuring.

This affects the Tracker's behavior when you click the Search button. If this value is far from the true distance, the Search function will not work very well.

Use PowerLock

PowerLock is the system that uses the Tracker's video camera to lock on to reflectors that are up to 2 degrees away from the beam.

If your Tracker does not have a PowerLock system, this checkbox will be greyed out.

Most users will want to leave PowerLock on unless they are tracking several reflectors that are close together.

It is possible for the Use PowerLock checkbox to become out of sync with the actual setting on the system. If this happens, cycling through the option once should fix it.

Buttons

Go 6DOF-0

Points the Tracker's laser beam straight out the front, where it is easy to catch with the T-Probe.

Bird Bath

Points the Tracker's laser beam at the magnetic "Bird Bath" that stores reflectors.

If the tracker is currently tracking a T-Probe, this will behave the same as the **Go 6DOF-0** button.

Search

Moves the Tracker's laser beam in a spiral pattern to lock on to a reflector after losing tracking.

This is mainly useful for systems where PowerLock is disabled or not available.

The spiral is not large, so you must still hold the reflector very close to the beam.

Initialize

Re-initializes the Tracker. Detects any accessories that have been attached since the Tracker was first initialized.

Initializing includes a calibration routine. Leica recommends to re-initialize every few hours during use.

Set Weather

Opens a separate dialog where you can manually set the temperature, barometric pressure, and humidity of the Tracker environment.

If the Tracker has a Meteo Station attached, the manual entry fields will be greyed out.

Click OK to commit the values to the Tracker. The values should show up in the **Weather Data** indicator on the lower left hand of the interface.

Disconnect

The Tracker Plug-In maintains a constant connection to the hardware, even when not actively collecting data.

If you are using a Steinbichler T-Scan with your Tracker, you must disconnect the Tracker Plug-In before starting the T-Scan Plug-In.

Known Issues

No Automatic Weather Dialog

If the Tracker does not have the Meteo Station accessory, then it uses manual input for weather data.

Manual data is stored in the Tracker between uses.

The Plug-In does not warn you when it is using manual data. If the previous data stored on the Tracker is not correct, measurements will be wrong.

In a future version, the Plug-In will alert the user when it is using manual weather data.

No Validation of Single-Point Time

It is possible to set a single-point measurement time outside the valid range, such as 1ms or 1,000,000,000ms.

The Plug-In will not alert the user when this happens, but the setting will have no effect.

No Validation of Search Distance

The same problem exists for search distance.

Go 6DOF-0 uses Search

The **Go 6DOF-0** button initializes a spiral search after it moves the laser. This behavior will be removed in a future version.

Long Measurement for Offset Points

When defining an offset point for feature probing, the Plug-In will do a full single-point measurement even though it doesn't need the accuracy of an averaged measurement. In a future release, offset points will use a faster and less accurate measurement.